Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Amended) A superconducting rotor with a cooling system located inside, comprising:

a superconducting field coil; and

cooling means for cooling the superconducting field coil by ~~a low temperature end formed by~~ means of heat and enthalpy flow generated by repeated compression and expansion of a working fluid.

2. (Original) The rotor as set forth in claims 1, wherein the working fluid is helium gas.

3. (Original) A superconducting rotor with a cooling system located inside, comprising:

a superconducting field coil excited by an external power source for generating a strong magnetic field;

a field coil supporting member for supporting the superconducting field coil;

a pulse tube refrigerator comprising: an annular-shaped regenerating tube disposed inside the field coil supporting member and connected to a low temperature end connection part; a pulse tube disposed inside the regenerating tube and connected to the regenerating tube; a high

temperature end connection part connected between the regenerating tube and the pulse tube; a working fluid flowing tube disposed at the high temperature end of the regenerating tube for allowing a high pressure gas to flow into the regenerating tube and a low pressure gas to flow out of the regenerating tube; a double gas inlet valve connected between the working fluid flowing tube and the pulse tube at the high temperature end connection part; and a gas buffer tank connected to the pulse tube at the high temperature end connection part via an orifice valve;

a torque tube connected to the field coil supporting member, and rotated by means of the strong magnetic field generated by the field coil; and

working fluid supplying means for alternately supplying a high pressure working fluid and a low pressure working fluid to the working fluid flowing tube.

4. (Original) The rotor as set forth in claim 3, further comprising:

an inner rotor cylinder for enclosing at least the field coil supporting member including the superconducting field coil;

an outer rotor cylinder for enclosing the inner rotor cylinder; and

a thermal radiation shield mounted between the inner rotor cylinder and the outer rotor cylinder.

5. (Original) The rotor as set forth in claim 3, wherein the working fluid supplying means comprises:

a rotary sealing unit connected to the working fluid flowing tube;

a compressor for compressing the working fluid; and

a rotary valve for alternately supplying the high pressure working fluid and the low pressure working fluid from the compressor to the working fluid flowing tube via the rotary sealing unit.

6. (Original) The rotor as set forth in claim 3, wherein the working fluid supplying means comprises a linear compressor rotated along with the torque tube for repeatedly compressing and expanding the working fluid in the working fluid flowing tube.

7. (Original) The rotor as set forth in claims 3, wherein the working fluid is helium gas.

8. (Amended) A superconducting generator, comprising:

a superconducting rotor including

a superconducting field coil, and

cooling means for cooling the superconducting field coil ~~by a low temperature end formed~~ by means of heat and enthalpy flow generated by repeated compression and expansion of a working fluid; and

an armature disposed around the superconducting rotor while being spaced apart from the superconducting rotor,

wherein the magnetic field generated at the field coil is rotated as the superconducting rotor is rotated so that an electric current is induced at the armature.

9. (Original) A superconducting generator, comprising:

a superconducting rotor including

a superconducting field coil excited by an external power source for generating a strong magnetic field,

a field coil supporting member for supporting the superconducting field coil,

a pulse tube refrigerator consisting of an annular-shaped regenerating tube disposed inside the field coil supporting member and connected to a low temperature end connection part, a pulse tube disposed inside the regenerating tube and connected to the regenerating tube, a high temperature end connection part connected between the regenerating tube and the pulse tube, a working fluid flowing tube disposed at the high temperature end of the regenerating tube for allowing a high pressure gas to flow into the regenerating tube and a low pressure gas to flow out of the regenerating tube, a double gas inlet valve connected between the working fluid flowing tube and the pulse tube at the high temperature end connection part, and a gas buffer tank connected to the pulse tube at the high temperature end connection part via an orifice valve,

a torque tube connected to the field coil supporting member, and rotated by means of the strong magnetic field generated by the field coil, and

working fluid supplying means for alternately supplying a high pressure working fluid and a low pressure working fluid to the working fluid flowing tube; and

an armature disposed around the superconducting rotor while being spaced apart from the superconducting rotor,

wherein the magnetic field generated at the field coil is rotated as the superconducting

rotor is rotated so that an electric current is induced at the armature.

10. (Amended) A superconducting motor, comprising:

a superconducting rotor including

a superconducting field coil, and

cooling means for cooling the superconducting field coil ~~by a low temperature end formed~~ by means of heat and enthalpy flow generated by repeated compression and expansion of a working fluid; and

an armature disposed around the superconducting rotor while being spaced apart from the superconducting rotor,

wherein the superconducting rotor is rotated by means of the magnetic field generated at the field coil of the superconducting rotor as an electric current is applied to the armature so that the rotating force is transmitted to the outside.

11. (Original) A superconducting motor, comprising:

a superconducting rotor including

a superconducting field coil excited by an external power source for generating a strong magnetic field,

a field coil supporting member for supporting the superconducting field coil,

a pulse tube refrigerator consisting of an annular-shaped regenerating tube disposed inside the field coil supporting member and connected to a low temperature end connection part, a pulse tube disposed inside the regenerating tube and connected to the regenerating tube, a high

temperature end connection part connected between the regenerating tube and the pulse tube, a working fluid flowing tube disposed at the high temperature end of the regenerating tube for allowing a high pressure gas to flow into the regenerating tube and a low pressure gas to flow out of the regenerating tube, a double gas inlet valve connected between the working fluid flowing tube and the pulse tube at the high temperature end connection part, and a gas buffer tank connected to the pulse tube at the high temperature end connection part via an orifice valve,

a torque tube connected to the field coil supporting member, and rotated by means of the strong magnetic field generated by the field coil, and

working fluid supplying means for alternately supplying a high pressure working fluid and a low pressure working fluid to the working fluid flowing tube; and

an armature disposed around the superconducting rotor while being spaced apart from the superconducting rotor,

wherein the superconducting rotor is rotated by means of the magnetic field generated at the field coil of the superconducting rotor as an electric current is applied to the armature so that the rotating force is transmitted to the outside.

12. (New) The superconducting rotor as recited in claim 1, wherein said cooling means comprises a pulse tube refrigerator having a gas piston.

13. (New) The superconducting rotor as recited in claim 10, wherein said cooling means comprises a pulse tube refrigerator having a gas piston.